

IN THE U.S. PATENT AND TRADEMARK OFFICE

APPEAL BRIEF TRANSMITTAL FORM

August 27, 2004

Transmitted herewith is an Appeal Brief (in triplicate) on behalf of the Appellants in connection with the above-identified application.

A Notice of Appeal was filed on June 30, 2004.

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Respectfully submitted,

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(Rev. 02/08/2004)



Docket No. 1163-0258P

Application No. 09/424,661

**MS APPEAL BRIEF - PATENTS**  
1163-0258P

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of

Before the Board of Appeals

Tatsuya MITSUGI

Appeal No.:

Appl. No.: 09/424,661

Group: 2177

Filed: November 29, 1999

Examiner: ALI, Mohammad

For: OBJECT DATA RETRIEVING DEVICE, OBJECT DATA  
RETRIEVING METHOD, AND COMPUTER-READABLE  
RECORDING MEDIUM CONTAINING RECORDER DATA

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TABLE OF CONTENTS

I. Real Party in Interest .....	4
II. Related Appeals and Interferences.....	4
III. Status of the Claims.....	4
IV. Status of Amendments.....	5
V. Summary of the Invention .....	5
VI. The Issues.....	11
VII. Grouping of the Claims.....	11
VIII. Argument .....	12
A. Claims 1-3, 6, and 8-17 are not properly rejected under 35 U.S.C. ....	12
IX. Conclusion .....	23
APPENDIX – CLAIMS APPEALED.....	25

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**BRIEF FOR APPELLANT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

August 27, 2004

Sir:

This appeal is from the decision of the Examiner dated May 18, 2004, rejecting claims 1-3, 6 and 8-17, which are reproduced as an Appendix to this Brief. This Brief is being filed in triplicate with the requisite fee.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17 and 1.21 that may be required by this paper, and to credit any overpayment, to deposit account 02-2448.

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I. Real Party in Interest

The named inventors have assigned their rights to the invention that is disclosed in the application and any patent that may issue therefrom to Mitsubishi Denki Kabushiki Kaisha, as recorded in the Patent and Trademark Office at Reel 010530, Frame 0180.

II. Related Appeals and Interferences

To the best of the knowledge of the undersigned, there are no other appeals or interferences known to Appellant, the Appellant's representatives, or the above noted assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. Status of the Claims

Claims 1-3, 6, and 8-17 are currently pending in the application and are the subject of this appeal. Claims 4, 5, and 7 have been cancelled. Claims 1, 3, 8, and 9 are independent.

#### IV. Status of Amendments

No Amendments After Final have been filed. The last Reply which was entered was the Reply to Office Action under 37 C.F.R. § 1.111 that was filed on March 2, 2004 and subsequently entered. An informal Amendment was e-mailed to Examiner Mohammad Ali on May 12, 2004 but this informal Amendment was not entered.

#### V. Summary of the Invention

The present invention is directed to search methods and devices intended for navigational systems. Navigation systems such as those found in automobiles typically have an associated database storing various destinations that may be of interest to the driver. In order to find a particular destination of interest, the driver may input search criteria that are used by the system to search the database. Conventional search techniques in this area are insufficient.

Typical problems confronted by the conventional navigation search systems are the inability to narrow the search results sufficiently enough to permit the driver to quickly determine his desired destination. Fig. 1 exemplifies the conventional database which utilizes very limited search data 19 including only location 19a, keyword 19b and text 19c in order to find destination data 14. Utilizing the conventional database such as that shown in

Fig. 1 will not typically provide narrow search results that are useful to the driver. This is particularly true when the user is trying to find his destination while driving such that reviewing a long list of imprecise search results is not practical or even safe.

One aspect of the invention is to utilize an improved database such as that shown in Fig. 6. The improvements in this database include the expanded search data 15 which has the additional components of categorized search words that are categorized according to sentence element categories of a natural language. For example and as shown in Fig. 6, these categorized search words are categorized according to sentence elements and include a subject 15a (agent of action), verb 15b (action category), object 15c (object of action category), and the so-called 15d category (another objection of action category). Categorizing the search data in this fashion permits a very rapid and accurate retrieval of the object data representing the destination data of interest to the user.

Another problem addressed by the present invention is the relatively narrow bandwidth or transfer rate that may exist between the navigational system and a base station that contains the database. This problem does not exist when the database is on a disk such as a DVD or CD ROM but is present when the database is remotely located such that a wireless communication is necessary to access the remote database. Conventional navigational search



systems utilize relatively simple and unsophisticated search criteria and hierarchically classify the destination data (object data). Such conventional techniques require a large quantity of data to be transferred over the communication channel which makes such conventional techniques unsuitable for the vehicle navigation systems (see page 3, lines 14-27).

The present invention addresses these problems by utilizing a well organized database (e.g., as shown in Fig. 6) and targeted search technique to quickly and efficiently find destination data (object data). Moreover, this search is conducted based on search criteria that are entered in the form of a sentence in a natural language. Thus, a user may simply speak in a normal fashion to query the system or otherwise input a natural language sentence to input the search criteria. This is a key advantage and greatly increases the accessibility and convenience of the navigation search system.

Fig. 2 illustrates a main embodiment of the inventive apparatus which includes a car navigation system 1 and navigation server 2. A car navigation system may accept spoken commands via voice input unit 4 which are then processed by the central processing unit 6. A GPS unit 5 may determine the location in conjunction with map data stored on the CD ROM drive 7. Search criteria are processed by the central processing unit 6 which accesses the remote database 3 in the navigation server 2 via the wireless terminal unit 10 and wireless host unit 11.

Fig. 8 illustrates the other main alternative of the inventive apparatus. Instead of wirelessly accessing a remote database 3, the database may be stored on a local memory device 16 such as a CD ROM shown in Fig. 8.

In the remotely accessed database 3 embodiment shown in Fig. 2, a database management system DBMS 12 searches the database 3 according to the method described below. In the local database apparatus shown in Fig. 8, the central processing unit 18 searches the database stored on the memory device 16.

The inventive search method begins with an analysis of the input sentence. As mentioned above, search criteria may be input to the invention by merely speaking or inputting a sentence in a natural language form. This is typically done by speaking the search command sentence into the voice input unit 4.

As shown in Fig. 3 and as described on page 11, last paragraph, this input sentence is first analyzed (ST1) in accordance with the sentence grammar of the natural language in order to extract search words. These extracted search words correspond to sentence element categories of the natural language including the subject, verb, and object search criteria. These extracted search criteria may then be transmitted to the navigation server 2 as shown in step ST2 of Fig. 3 and as discussed on page 12, first paragraph. The search process ST3 (see Fig. 4 in page 12, first paragraph) is then conducted

on the extracted search criteria that are categorized according to sentence element categories. The results of the search are transmitted back to the vehicle navigation system 1 for display to the user as discussed in step 54 shown in Fig. 4 and step ST5 shown in Fig. 5 and as further discussed in page 12, second paragraph.

Fig. 9 shows the alternative high-level flow for the second embodiment where the database is localized and no wireless transmission is necessary. As shown in Fig. 9 and as discussed on pages 17-18, the main flow is largely the same but excludes the wireless transmission steps. As shown therein, the voice input is analyzed (ST1), the search process (ST3) is conducted, and the results output (ST5) to the user.

The inventive search methodology utilized is shown in Fig. 7 and discussed on page 13, line 24 through page 16, line 12. A key aspect of the inventive search technique is the categorization of the search criteria such that the search words are respectively categorized corresponding to sentence element categories of a natural language such as English.

Another key aspect of the invention is the category-by-category search. For example, step ST6 retrieves search words corresponding to the subject category such that the subject category search words are searched (ST11) against the corresponding (subject) database category. Likewise, the verb category search words are retrieved (ST7) and searched against candidates in

the verb portion of the database. This continues in turn such that each search criteria in each sentence element category is searched against the corresponding search element category in the database. Such a category-by-category search has key advantages in efficiency and accuracy of the search.

The results of the category-by-category search may then be filtered by the overlapping SVOC link relation filter ST16. Overlapping search results (tuples) are filtered out of the results and further filtering occurs for attribute relations based on the grammatical structure of the natural language.

Thus, the invention permits a search query to be easily inputted by a vehicle driver by simply speaking the search command sentence utilizing a natural language format. This prevents distractions thereby providing a safer driving environment while also permitting the user to easily communicate his desires to the navigation search system. This natural language sentence input is then analyzed to extract search words corresponding to sentence element categories which are then subjected to a category-by-category search.

The category-by-category search and the database organized by sentence element categories permits a very rapid and accurate search. Furthermore, the inventive techniques reduce the necessary bandwidth when the wireless system is used such that the very limited amount of search criteria data are transmitted from the car navigation system 1 to the navigation server 2. The accuracy of the search also permits a small amount of search result data to be

sent from the navigation server 2 back to the car navigation system 1. These are extremely advantageous features, particularly in the vehicle navigation art.

VI. The Issues

The May 18, 2004 Office Action presents one issue for review on Appeal.

1. Whether claims 1-3, 6, and 8-17 are properly rejected under 35 U.S.C. § 103(a) as being obvious in view of Paik (USP 6,076,088) in view of DeLorme (USP 5,948,040).

VII. Grouping of the Claims

For purpose of this appeal, Appellant groups the claims as follows:

- A) Independent claim 1 and its dependent claims 2, 6, and 14 stand or fall together.
- B) Independent claim 3 and its dependent claim 15 stand or fall together.
- C) Independent claim 8 and its dependent claim 16 stand or fall together.
- D) Independent claim 9 and its dependent claims 10, 11, 12, 13, and 17 stand or fall together.

VIII. Argument

- A. Claims 1-3, 6, and 8-17 are not properly rejected under 35 U.S.C. § 103(a) in view of Paik (USP 6,076,088) in view of DeLorme (USP 5,948,040)

Paik discloses a method and system that extracts information from a large corpus of work. Specifically, Paik extracts Concept Relation Concept (CRC) triples from a large body of text to build a KR (Knowledge Representation) database. As discussed in column 9, lines 44-62, Paik processes a raw text document by first parsing the text to identify sentence and paragraph boundaries and then by utilizing an optional syntactic parser that tags each word with a part of speech. These syntactic tags are then utilized to construct the main data format or Knowledge Representation of the text.

These syntactic tags are utilized to construct the Concept Relation Concept (CRC) triple. This is further shown in Fig. 11, wherein the target article about Robert Dole is processed to extract numerous CRC triples for the subject "Bob Dole." The CRC data representation is a very specific representation utilized by Paik to advantage because it permits rigorous analysis of large amounts of text. The CRC triple data representation also permits a wide range of queries.

Significantly, when a query is entered into the Paik system, the query is also represented as a CRC triple. (See the paragraph bridging columns 9 and

10 where the query-processing module 100' includes a CRC extractor 105 and a CRC-to-KR Translator 110'). Most significant is the Similarity Measurer 55, which is the unit responsible in Paik for matching queries to knowledge stored in the KR database 115. The Knowledge Representation of the query and the corpus is quite distinct from and does not disclose or suggest the categorical storage of information and categorical searching processing utilized by the invention and recited in the claims.

More specifically, Paik fails to disclose or suggest a database that stores destination object data in association with a plurality of categorized attribute words categorized according to sentence elements of a natural language. The KR database utilized by Paik does not categorize according to sentence elements of a natural language. Quite to the contrary, Paik utilizes the CRC triple and KR representation thereof to both store the text information and compare query text to the stored text for a response to a query.

Paik also fails to disclose or suggest categorizing search words corresponding to sentence element categories of a natural language. More specifically and in terms of independent claim 1 language, Paik fails to disclose or suggest a criteria retrieval unit that analyzes the search criteria and retrieves categorized search words respectively categorized in corresponding sentence element categories of the natural language. Although Paik does permit

queries to enter in the form of a sentence, Paik fails to disclose or suggest categorization of search words as recited in the claims.

Paik further fails to disclose or suggest a destination object retrieval unit that categorically searches sentence categories of the database using each of the categorized search words, respectively associated with the sentence element categories as recited in independent claim 1. Clearly, the search performed by Paik determines the “degree of similarity between the query KR unit(s) and every KR unit in the KR database 115” (see column 22, lines 17-19). The KR units are quite distinct from and not even remotely suggestive of the categorical storage, search and retrieval utilized by the invention wherein the categories correspond to the sentence element of a natural language. Such sentence elements include, for example, agent-of-action, action, and object-of-action categories. While Paik may mention terms of speech, such as action and agent-of-action, these parts of speech are utilized in an entirely different manner by Paik to construct CRC triples and KR representations.

Paik also fails to enjoy many of the advantages achieved by the present invention. Namely, by categorizing the database into separate categories corresponding to the sentence elements of a natural language (e.g., agent-of-action, action, object-of-action, etc.), the search and retrieval steps are faster and more efficient. In other words, an input sentence is analyzed to extract search criteria. Each of the search criteria is categorized. During the search



process, the categorized search data is matched against all of the attribute data within that same category. For example, search data that has been identified as an agent-of-action category is compared against all of the attribute data in the agent-of-action category of the database. Thus, only a small subset of the entire database needs to be searched which greatly reduces the search time and increases the efficiency of the search process.

In contrast, Paik's search process is much slower and less efficient. Indeed, the entire KR Database 115 would need to be searched for each KR unit of the query. Thus, an extremely large database such as one taken from an entire encyclopedia would require an exhaustive and lengthy search of all of the extracted KR units in order to match a search KR unit against that gigantic database.

Moreover, the application of the present invention is quite distinct from the application of Paik. Namely, Paik is a robust information extraction system that extracts knowledge and information from a wide variety of text and is able to respond to a large range of queries. The present invention, in contrast, is primarily concerned with determining destination data based on a natural language query and the claims have been amended accordingly. The type of search being performed is for destination data. Furthermore, the queries made of such a database are to determine the destination desired or inferred from a natural language query. Such queries are limited in form and scope and can be

broken down into sentence element categories for efficient storage and retrieval therefrom.

Paik further fails to disclose or suggest the method of searching destination-of-travel object data as recited in independent claim 8. In particular, Paik fails to disclose or suggest storing destination-of-travel object data in association with a plurality of categorized attribute words, wherein the attribute words are categorized and stored according to sentence elements of a natural language.

Paik further fails to disclose or suggest searching sentence element categories of the database or retrieving destination-of-travel object data associated with the categorized attribute words that match a single search word or a plurality of search words in the same category as recited in amended claim 8. Because Paik fails to disclose or suggest any such sentence categories as argued above, Paik is incapable of disclosing or suggesting storing, searching, or retrieving utilizing of the sentence categories as further recited in independent claim 8.

Paik further fails to disclose or suggest a destination of travel object data search method as recited in independent claim 3. More specifically, Paik fails to disclose or suggest retrieving a plurality of search words by analyzing and categorizing the search criteria in accordance with a grammar of the natural language. Paik further fails to disclose or suggest conducting a category-by-

category search relative to a plurality of sentence element categories associated with a plurality of destination-of-travel object data items. At best, Paik discloses a KR unit by KR unit search which is not even remotely suggestive of the category-by-category search utilized by the invention particularly where the categories are in accordance with a grammar of a natural language.

Furthermore, Paik fails to disclose or suggest certain features of independent claim 9. More specifically, Paik further fails to disclose or suggest storing destination object data in association with categorized attribute words categorized according to sentence elements of the natural language. Paik further fails to disclose or suggest that the categorized storage includes the following categories: agent-of-action, action, and object-of-action categories. Nor does Paik disclose or suggest retrieving one or more categorized search words from the query such that each search word has an associated one of the categories corresponding to sentence elements of the natural language. As further recited in independent claim 9. Even more significantly, Paik fails to disclose or suggest categorically searching the attribute for a match with the retrieved search word as further recited in independent claim 9. This is even more particular true in view of the "wherein" clause of claim 9 that specifies that the category of attribute words searched by said searching step corresponds to the category of the search word. Most of the categorical search

is performed or remotely suggested by Paik, particularly as this categorical search is particularly defined in independent claim 9.

Appellant respectfully submits that the arguments above are sufficient to remove Paik as a valid and applicable reference against the pending claims. Furthermore, DeLorme fails to remedy any of the noted deficiencies in Paik.

DeLorme is merely a travel reservation and planning system that permits a user to make travel arrangements and plan travel activities. For example, a user may input preferred transportation mode, travel times/date frames, starting point, final destination, etc. to ultimately generate a “map ticket” containing various media that guides the tourist along the proposed travel route.

First of all, it is not understood how or why the Office Action proposes to combine DeLorme with Paik. The Office Action admits that Paik does not teach destination of travel data and utilizes this admission as a “basis” for combining Paik with DeLorme.

Paik, however, already discloses analyzing location information in a document. As discussed in column 16, line 45 through column 17, line 59, Paik discloses a very specific set of special semantic relations that permits Paik’s invention to analyze text having location or geographic information therein. These special semantic relations, in other words, permit Paik to form the CRC triples and knowledge representations that are key to his storage and

retrieval functions. It is not understood how DeLorme's travel planner fits in any way into the Paik system. Appellant is left to conclude that the sole source of motivation for combining these references taken from Appellant's specification, which is an improper source of motivation.

The Federal Circuit has made it very clear that "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat the patentability – the essence of hindsight." *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999).

The required evidence of a teaching, suggestion, or motivation to make the cited combination of references can be found either in the prior art references themselves (the most typical location), the knowledge of one of ordinary skill in the art, or in some cases, from the nature of the problem to be solved. *Id.* The range of potential sources, however, does nothing to diminish the requirement for actual evidence. "The showing must be clear and particular" and cannot be met by broad conclusory statements. *Id.*

Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior

art also suggests the desirability of the combination” M.P.E.P. at § 2143.01, citing *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990).

Appellant respectfully submits that the Examiner fails to provide any evidence of a teaching, motivation, or suggestion that would cause one of ordinary skill in the art to combine Paik with Delorme.

Assuming, *in arguendo*, that the combination of Paik and DeLorme is somehow proper, Appellant asserts that this combination still fails to teach or suggest the invention, particularly as recited in the appealed claims. Specifically, DeLorme has no concept of categorization according to sentence element. DeLorme fails to disclose or suggest either storing or retrieving information utilizing sentence element categories. While DeLorme does disclose destination information and processing destination information as a part of a travel planning software, such a purpose in the implementation thereof are entirely distinct from, not combinable with, and certainly not disclosing or suggesting the invention as recited in the independent claims.

Appellant respectfully submits that the resultant combination of Paik and DeLorme fails to disclose every claimed feature in independent claims 1, 3, 8 or 8. In order to establish *prima facie* obviousness, all claim limitations must be taught or suggested in the prior art. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

More specifically, the combination of Paik and DeLorme fails to disclose or suggest the database of claim 1 which stores destination object data in association with a plurality of categorized attribute words categorized according to sentence of a natural language. The combination of Paik and DeLorme also fails to disclose or suggest a criteria retrieval unit for analyzing the search criteria in the form of a sentence and retrieving one or a plurality of search words respectively categorized corresponding to a sentence to categories of the natural language as further recited in independent claim 1. This combination of references also fails to disclose or suggest a destination object retrieval unit for categorically searching sentence categories of the database using each of the categorized search words respectively associated with the sentence element categories.

With respect to independent claim 3, the combination of Paik and DeLorme fails to disclose or suggest retrieving a plurality of search words from a search criteria input in the form of a sentence of a natural language by analyzing and categorizing the search criteria in accordance with a grammar of the natural language. Paik and DeLorme, even when taken in combination, also fail to disclose or suggest conducting a category-by-category search relative to a plurality of sentence element categories associated with a plurality of destination of travel object data items based on the plurality of search words. Paik is cited as teaching this feature but his search is based on CR units which

is not even remotely suggestive of the category-by-category search utilized by the invention, particularly where the categories are in accordance with a grammar of a natural language.

With respect to independent claim 8, the combination of Paik and DeLorme also fails to disclose or suggest storing destination of travel object data in association with a plurality of categorized attribute words, wherein the attribute words are categorized and stored according to sentence elements of a natural language. No such categorical storage is disclosed or suggested by the combination of Paik and DeLorme. This combination also fails to disclose or suggest searching sentence element categories of the database using each of the search words respectively associated with the sentence element categories as further recited in independent claim 8. Again, Paik is cited to teach this feature but he utterly fails to teach or even remotely suggest this feature. Extensive arguments are presented above and are hereby incorporated by reference.

As to independent claim 9, the combination of Paik and DeLorme also fail to disclose or suggest the method of determining a destination based on a natural language query. More specifically, the combination of Paik and DeLorme fail to disclose or suggest storing destination object data in association with categorized attribute words categorized according to sentence elements of the natural language, wherein the categories include agent of



action, action, and objective action categories. No such categorical storage is disclosed or suggested by the applied art, even when taken in combination.

Still further, the combination of Paik and DeLorme also fails to disclose or suggest categorically searching the attribute words for a match with the retrieved search word and retrieving the destination objection date associated with the attribute word that matches the search word. This is particularly true as the further language of independent claim 9 specifies that the category of attribute words searched by said searching step corresponds to the category of the search word. Such a categorical search methodology is entirely alien to Paik and DeLorme. Clearly, Paik is relied upon to teach this feature but his KR representation and search method based on KR data sets is entirely opposite to the categorical searching claimed herein.

Accordingly, Appellant respectfully submits that the rejection of claims 1-3, 6, and 8-17 under 35 U.S.C. § 103(a) based on the combination of Paik and DeLorme is improper and must be reversed.

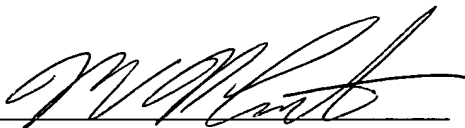
#### IX. Conclusion

For the reasons advanced above, it is respectfully submitted that all of the claims in this application are allowable. This, favorable reconsideration and reversal of the Examiner's rejection of claims 1-3, 6, and 8-17 by the Honorable Board of Patent Appeals and Interferences, is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. 1.16 or under 37 C.F.R. 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Appendix – Claims Appealed

**APPENDIX – CLAIMS APPEALED**

Claim 1.

An object data search apparatus comprising:

a database for storing destination object data in association with a plurality of categorized attribute words categorized according to sentence elements of a natural language;

an input unit for receiving an input of search criteria in the form of a sentence of the natural language;

a criteria retrieval unit for analyzing the search criteria in the form of the sentence and retrieving one or a plurality of categorized search words respectively categorized corresponding to sentence element categories of the natural language;

a destination object retrieval unit for categorically searching sentence categories of the database using each of the categorized search words respectively associated with the sentence element categories, and retrieving the destination object data associated with the categorized attribute words that match a single search word or a plurality of search words in the same category, wherein filtering for attribute relation based on the grammatical structure of the natural language is performed; and

an output apparatus for outputting the destination object data thus retrieved.

Claim 2.

The object data search apparatus according to claim 1, wherein said database stores destination object data at least associated with an attribute word having an agent of action category, an attribute word having an action category and an attribute word having an object of action category.

Claim 3.

A destination-of-travel object data search method comprising the steps of:

receiving an input of search criteria in the form of a sentence of a natural language;

retrieving a plurality of search words from the search criteria input in the form of a sentence of a natural language by analyzing and categorizing the search criteria in accordance with a grammar of the natural language;

conducting a category-by-category search relative to a plurality of sentence element categories associated with a plurality of destination-of-travel object data items, based on the plurality of search words; and

retrieving the destination-of-travel object data associated with the attribute word that matches a single search word or a plurality of search words and outputting the destination-of-travel object data thus retrieved;

said conducting and retrieving using at least a search word having an agent of action category, a search word having an action category and a search word having an object of action category.

Claim 4.

Cancelled

Claim 5.

Cancelled

Claim 6.

The object data search apparatus according to claim 1, said object retrieval unit retrieving a plurality of tuples and filtering the tuples so that overlapping tuples are filtered off.

Claim 7.

Cancelled.

Claim 8.

A method of searching destination-of-travel object data comprising:

storing destination-of-travel object data in association with a plurality of categorized attribute words, wherein the attribute words are categorized and stored according to sentence elements of a natural language;

receiving an input of search criteria in the form of a sentence of a natural language;

analyzing the search criteria in the form of the sentence and retrieving at least one of a plurality of search words respectively corresponding to sentence element categories of the natural language;

searching sentence element categories of the database using each of the search words respectively associated with the sentence element categories, and retrieving the destination-of-travel object data associated with the categorized attribute words that match a single search word or a plurality of search words in the same category, wherein filtering for attribute relation based on the grammatical structure of the natural language is performed; and

outputting the destination-of-travel object data thus retrieved.

Claim 9.

A method for determining a destination based on a natural language query, comprising:

storing destination object data in association with categorized attribute words categorized according to sentence elements of the natural language, wherein the categories include agent-of-action, action, and object-of-action categories;

inputting a query utilizing a natural language sentence;

retrieving one or more categorized search words from the query such that each search word has an associated one of the categories corresponding to sentence elements of the natural language;

categorically searching the attribute words for a match with the retrieved search word and retrieving the destination object data associated with the attribute word that matches the search word,

wherein the category of attribute words searched by said searching step corresponds to the category of the search word, and

outputting the destination object data retrieved by said categorical search.

Claim 10.

The method according to claim 9,  
said categorical searching including:

when the search word is in the agent-of-action category, searching the agent-of-action category for a match with the search word;

when the search word is in the action category, searching the action category for a match with the search word; and

when the search word is in the object-of-action category, searching the object-of-action category for a match with the search word.

Claim 11.

The method according to claim 9, wherein the categories include agent-of-action, action, object-of-action, and key word categories.

Claim 12.

The method according to claim 11, wherein the destination object data includes destination position information and name information of a destination.



Claim 13.

The method according to claim 9, further comprising:

filtering for attribute relation based on a grammatical structure of the query.

Claim 14.

The object data search apparatus according to claim 1, wherein said input unit is a voice input unit for receiving a voice input of search criteria in the form of a sentence of the natural language.

Claim 15.

The destination-of-travel object data search method according to claim 3, said receiving step receiving a voice input of search criteria in the form of a sentence of the natural language.

Claim 16.

The method of searching destination-of-travel object data according to claim 8, said receiving step receiving a voice input of search criteria in the form of a sentence of the natural language.

Claim 17.

The method according to claim 9, said inputting step inputting a voiced query utilizing the natural language sentence and said retrieving step retrieving one or more categorized search words from the voiced query.